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*Published in:*

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*Recommended citation(APA):*

Fisher, C., & To, M. L. (2011). Micro job design: Affective reactions to real-time task characteristics. In N. L. Jimmieson, N. M. Ashkanasy, & L. M. Bradley (Eds.), *Proceedings of the 9th Industrial and Organisational Psychology (IOP) conference: Connectivity in a dynamic world - Human connection in a world of rapid change* (pp. 1-5). IOP Publishing. [https://pure.bond.edu.au/admin/files/25257496/Micro\\_job\\_design.pdf](https://pure.bond.edu.au/admin/files/25257496/Micro_job_design.pdf)

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Published: 01/01/2011

*Document Version:*

Publisher's PDF, also known as Version of record

[Link to publication in Bond University research repository.](#)

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## Micro Job Design: Affective Reactions to Real-time Task Characteristics

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### Abstract

Most job design research assesses the effects of typical job characteristics on long term person level outcomes. We suggest that it is also worth studying short term affective reactions to momentary variations in task characteristics over the working day; what we will call “micro job design.” While there may be across-the-board positive (or negative) reactions to some momentary task characteristics, we also hypothesise that there will be individual differences in reactions to task characteristics. In two experience sampling studies we demonstrate that, 1. High but not low growth need strength employees respond to increases in task demand with increasing positive emotions, and 2. High learning or low avoid goal orientation employees react to increasing task autonomy with larger increases in the experience of flow compared to low learning or high avoid goal orientation employees.

### Introduction

This paper suggests that attention be given to a new direction in job characteristics research: the relationship between momentary task characteristics and concurrent affective reactions. Nearly all past research on job design and the effects of job characteristics has been at the between-persons level, assessing relationships between measures of the typical level of various job characteristics and stable person level outcomes such as job satisfaction or performance. However, jobs are made up of many tasks, and individuals may engage in a large number of different tasks with varying characteristics over the course of a work day. Experience sampling studies have shown that perceived task characteristics vary widely over time within-person. For instance, Fisher, Minbashian, Beckmann, and Wood (2011) obtained reports of characteristics of managers’ current task five times per day for three weeks. They found that 82% of the variance in rated task importance and 76% of the variance in task demand (task difficulty plus importance) was within-person. We know very little about how individuals respond affectively or behaviourally to these momentary fluctuations in task characteristics, or to the succession of task characteristics encountered over the work day or work week. Hence, we suggest that research is needed on

what might be called “micro job design.” The aim would be to understand how individuals experience and respond to short-term variations in task characteristics in real time.

Past between-persons research on job characteristics has established that job scope and its components (skill variety, task significance, task identity, autonomy, and feedback from the job) are positively associated with job satisfaction, organisational commitment, job involvement, and internal work motivation (Humphrey, Nahrgang, & Morgeson, 2007). This might seem to indicate that high job scope is always experienced as pleasant and engaging. However, Humphrey et al. (2007) also found that task variety, task significance, and job complexity were positively correlated with perceptions of role overload. There is a large body of research and theory on stress suggesting that job demands are positively related to unpleasant outcomes such as burnout, emotional exhaustion, and anxiety (e.g. Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Attributes of tasks such as complexity, time pressure, importance, or autonomy may be seen as *challenge-stressors* (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). While challenge-stressors present the opportunity to grow and seek mastery and thus may be positively associated with pleasant emotions and engagement, they also require the investment of resources, present uncertainty, and subject performers to the risk of failure, which may lead to negative affective outcomes. Challenge-stressors have been found to positively predict the pleasant affective outcomes of job satisfaction and work engagement while also positively predicting the unpleasant emotional experiences of anxiety and burnout in between-persons studies. In sum, it seems possible that enriched task characteristics may be related to both positive and negative affective outcomes.

There is very little research on real-time reactions to fluctuations in task characteristics at the within-person level. Momentary task characteristics such as task importance, task difficulty, and autonomy might be seen as affective events, the appraisal of which is likely to lead to concurrent emotions (Weiss & Cropanzano, 1996). Research on intrinsic motivation, flow experiences, boredom, and stress also point to task characteristics as antecedents of near-term affective

outcomes. A small number of experience sampling studies have investigated relationships between momentary task activities or characteristics and concurrent affective outcomes at the within-person level. Teuchmann, Totterdell, and Parker (1999) assessed time pressure and negative mood three times per day and reported an average within-person correlation of .36 between these variables. Barling and Macintyre (1993) found that daily work overload was positively related to daily negative mood and emotional exhaustion within-person. Fisher et al. (2011) reported that momentary task importance was positively related to feelings of both enthusiasm and stress. Task demand was negatively related to happiness, positively related to sadness, and strongly and positively related to feeling stressed. The current paper follows on from Fisher et al.'s work by exploring relationships between momentary task characteristics and affective reactions in two experience sampling studies. In addition to assessing main effects of some task characteristics on short term affective outcomes, we will also explore individual differences as moderators of responses to momentary task characteristics.

### **Individual differences and reactions to task characteristics**

Hackman and Oldham's (1980) Job Characteristics Theory proposes that growth need strength (GNS), conceptualised as individuals' preferences for challenging tasks and growth and development at work, may moderate reactions to job characteristics. They suggest that, "Individuals with strong needs for growth should respond eagerly and positively to the opportunities provided by enriched work. Individuals with low needs for growth, on the other hand, may not recognise the existence of such opportunities, may not value them, or may even find them threatening and balk at being "pushed" or stretched too far by their work" (p. 85, 1980). There is some empirical support for GNS as a moderator of employee reactions to task characteristics at the between-persons level.

At the within-person level, there is reason to suspect that not all employees will respond similarly to short term variations in task characteristics. For instance, those higher on growth need strength may respond particularly positively when encountering a task that is more demanding or autonomous than usual, and respond more negatively when performing simple tasks that do not offer growth opportunities.

A second possible moderator is goal orientation (Dweck and Leggett 1988). Learning goal orientation (also called mastery) refers to a goal of developing and improving one's skills, and is a very similar construct to growth need strength. It seems likely that individuals high on either of these constructs would view enriched task characteristics as pleasant challenges rather than as threats, and be likely to enjoy and become deeply involved in such tasks. In contrast,

those high on avoid goal orientation tend to shy away from more demanding situations in which they risk being seen to fail (DeShon & Gillespie, 2005). Such individuals may not respond as well to demanding or autonomous tasks.

Evidence for different short term affective reactions to tasks on the basis of goal orientation is found in two laboratory studies by Steele-Johnson, Beauregard, Hoover, and Schmidt (2000). In study 1, task difficulty was strongly negatively related to task satisfaction for individuals working under state performance goals, and unrelated to task satisfaction for those working under learning goals. In study 2, task difficulty was strongly and positively related to intrinsic motivation in the learning goal condition, but unrelated to intrinsic motivation in the performance goal condition.

The immediate stimulus to this paper is findings from an experience sampling study by Fisher et al. (2011) showing that dispositional goal orientations moderate within-person relationships between momentary task importance and the experience of concurrent emotions. Increasing task importance was associated with rapidly increasing sadness for those low on learning or high on avoid goal orientation, but was unrelated to sadness for those high on learning or low on avoid goal orientations. Avoid goal orientation moderated the relationship between task importance and happiness, with high avoid individuals rapidly becoming less happy as task importance rose. Those low on avoid goal orientation remained happy regardless of task importance. Enthusiasm increased with task importance for everyone, but increased faster for those low on avoid goal orientation. Finally, both goal orientations moderated the relationships between task importance and feeling stressed. Those low on learning goal orientation or high on avoid goal orientation became stressed faster as task importance increased.

This paper will report results for the main effects of some momentary task characteristics on immediate affective and engagement outcomes, and explore the extent to which GNS and learning and avoid goal orientations moderate reactions to fluctuations in task characteristics over time within-person. The data come from two prior experience sampling methodology (ESM) studies conducted by the authors. Both studies were originally conducted for other purposes, so only a subset of task characteristics and affective outcomes are available in each sample. Study 1 contains a measure of momentary task demand. The outcomes measured in Study 1 are multi-item measures of momentary positive and negative emotions. The moderator is growth need strength. In Study 2, we measure momentary autonomy as the task characteristic, "flow" as a pleasant outcome, and trait learning and avoid goal orientations as moderators. We hypothesise, following the research on job characteristics theory, that increasing task demand and autonomy will be positively related to pleasant affective outcomes and

flow on average. Recall that research from a stress perspective might make opposite predictions. However, because stress theories specify that sustained demands eventually produce exhaustion by gradually depleting resources (e.g. Demerouti et al., 2001), it might be that only long term exposure to demanding tasks produces negative affective outcomes. At the momentary level, reactions to more challenging and autonomous tasks are expected to be more positive on average.

H1: Task demand will be positively related to concurrent positive emotions (H1a) and negatively related to concurrent negative emotions (H1b) (Study 1).

H2: Autonomy will be positively related to the concurrent experience of flow (Study 2).

We also hypothesise that approach traits, in the form of growth need strength or learning goal orientation, will magnify the positive effects of task demand or autonomy on positive outcomes and minimise effects on negative outcomes. We make this prediction because high GNS/high learning goal individuals should be more likely to view task demand or autonomy as challenges that offer the desirable opportunity for growth. Conversely, those high on avoid goal orientation are likely to see these task demands as threats and should respond to them less positively.

H3: GNS will moderate the relationship between task demand and positive emotions (H3a) and negative emotions (H3b) (Study 1).

H4: Learning goal orientation (H4a) and avoid goal orientation (H4b) will moderate the relationship between autonomy and flow (Study 2).

## Method

### Sample and Procedure

Both Study 1 and Study 2 used experience sampling methodology. Participants were 120 individuals from a variety of jobs across 65 organisations (Study 1) and 68 advertising and research employees from twelve organisations (Study 2). Participants completed a one-time measure of growth need strength (Study 1) or trait goal orientation (Study 2). During the ESM period, they answered signals five times per day (Study 1) or twice per day (late morning, late afternoon, Study 2) for two weeks. Perceptions of task demand and emotions (Study 1) or task autonomy and flow (Study 2) were collected on the experience sampling surveys. ESM surveys were completed on paper following a signal from a programmed watch in Study 1 and on-line following an e-mail alert in Study 2. 4507 ESM reports were received from Study 1 participants and 1073 ESM reports were received from Study 2 participants. In Study 1, 625 responses received at moments respondents said they were on a break or otherwise not actively working were excluded from the analyses.

Scores on the dependent variable in the prior period were used as a control variable in all analyses to remove autocorrelation. Reports for which the lagged variable was not available (due to respondents skipping the immediately prior scheduled report) were dropped, resulting in a sample of 2550 complete ESM reports in Study 1 and 844 in Study 2.

### Study 1 Measures

The time frame for all ESM measures in Study 1 was momentary – participants reported what they were doing and feeling at the time the signal to respond was received. Task demand was assessed with three semantic differential items answered on five point scales. Respondents were asked, “How would you describe the task you were working on when the alarm rang?” Adjective pairs were “very simple---very complex,” “very easy---very difficult” and “routine---novel.” Items were averaged in each time period. Coefficient alphas averaged .89 across the 50 time periods. Momentary positive and negative emotions were measured with the Job Emotions Scale (Fisher, 1997), which contains eight positive and eight negative emotion items (average alphas .93 and .86).

Growth need strength was measured by Hackman & Oldham’s six item scale (1980). Reliability was .87. Dispositional positive and negative affect were also used as controls in Study 1. Dispositional affect was measured prior to the ESM period with the 20 item Positive and Negative Affect Scales by Watson, Clark, and Tellegen (1988, positive affect alpha .83, negative affect alpha .85).

### Study 2 Measures

The time frame for all ESM measures in Study 2 was “this morning” or “this afternoon.” Autonomy was measured with two items from the autonomy subscale of Spreitzer’s (1995) empowerment instrument (alpha .85). A sample item is, “I had significant autonomy in determining how I did my work.” The dependent variable was a four item measure of the experience of flow. Sample items are, “I was completely engrossed in my work” and “I was unaware of time passing while I concentrated on my work” (average alpha .80). Learning and avoid goal orientations were measured with four items each from VandeWalle (1997, alphas .74 and .84). Momentary positive and negative affect were used as controls in Study 2 to isolate the relationship between autonomy and flow. Positive and negative affect were measured with six items each on the ESM questionnaire (alphas .90 and .85).

## Results

Data were analysed with Hierarchical Linear Modeling. In all analyses, Level-1 predictors were centered at each individual’s mean to eliminate between-person variance and Level-2 predictors were grand-mean centered. A succession of models was analysed to test

the hypotheses. Model 1 included the control variables of the lagged dependent variable from the prior ESM report and dispositional positive and negative affect at Level 2 (Study 1) or current positive and negative affect at Level 1 (Study 2). Model 2 added the Level 1 task characteristic of task demand (Study 1) or autonomy (Study 2). Subsequent models added the Level 2 individual difference predictor of growth need strength in Study 1 and learning or avoid goal orientation in Study 2 to predict both the intercept and the slope of the task-characteristic to outcome relationship.

### Study 1 Results

There was no main effect of task demand on positive emotions, meaning that H1a was not supported. H3a predicted that GNS would moderate the effect of task demand on positive emotions, and this hypothesis was supported by a significant interaction term. Tests on the simple slopes revealed that as expected, those high on growth need strength were significantly more reactive to task demand ( $p < .01$ ). They experienced less positive emotions when task demand was low and rapidly increasing positive emotions as task demand rose. Those low on GNS were not reactive to changes in task demand in terms of positive emotions. Turning to negative emotions as the dependent variable, there was a main effect for task demand such that increasing task demand was associated with greater negative emotions. This is contrary to H1b, which had predicted a negative relationship. The interaction between task demand and GNS in the prediction of negative emotions (H3b) was not significant.

### Study 2 Results

Supporting H2, there was a significant and positive main effect of autonomy on flow. In addition, the interaction of autonomy and learning goal orientation (H4a) was significant. Tests on the simple slopes show that both high and low learning goal orientation individuals respond to increasing autonomy with increases in flow, but the relationship was considerably stronger for those high rather than low on learning goal orientation. The interaction between autonomy and avoid goal orientation (H4b) approached significance ( $p < .06$ ). Flow increased as autonomy increased, and did so more strongly for those low rather than high on avoid goal orientation.

## Discussion

We assessed both main effects of task characteristics and interactive effects of task characteristics and individual differences on concurrent affective outcomes. Considering main effects first, in Study 1, the main effect of task demand on positive emotions was not significant. Across the board, individuals did not feel any better emotionally in relation to how difficult/novel/complex their current task was. This is

contrary to expectations and inconsistent with job design theories, which would predict a substantial positive effect, and with stress theories, which might predict a negative effect. Task demand had a significant relationship with negative emotions, such that increasing task demand was associated with increasing negative emotions. This result is consistent with Fisher et al. (2011) but contrary to expectations based on job design theories. It is more consistent with stress theories that view job demands as drains on resources rather than as pleasurable opportunities to engage in challenging tasks. In Study 2, momentary task autonomy was positively and moderately strongly related to the experience of flow, as would be predicted by job design and intrinsic motivation theories.

The interaction effects in both studies showed that individuals reacted to task characteristics in different ways. In Study 1, individuals high on growth need strength were more affectively reactive to variations in task demand than those low in growth need strength in terms of positive but not negative emotions. In Study 2, individuals high on learning and low on avoid goal orientation were more responsive to task autonomy in terms of the experience of flow. These within-person findings parallel previous results of GNS moderation of the effects of job characteristics on outcomes at the between-persons level. Individuals who say they enjoy the opportunity to grow at work and who do not worry excessively about being seen to fail enjoy demanding and autonomous tasks more. The results presented here provide additional support for Fisher et al. (2011), who found that goal orientation moderated the effects of task importance on specific emotions in a similar manner. Consistent findings from three different samples that assessed three different task characteristics and investigated a range of affective outcomes suggest a robust phenomenon. These results also fit well with Dweck and Leggett's (1988) original conceptualisation of mastery and helpless response patterns, with those high on learning or growth orientations displaying more effective and adaptive emotional responses when encountering challenging tasks.

There are many avenues for further research on real-time reactions to momentary fluctuations in task characteristics. Two task characteristics were assessed in this paper and another one in Fisher et al. (2011), whereas Humphrey et al. (2007) identified sixteen task characteristics that are related to outcomes at the between-persons level. Some of these other characteristics are likely to be relevant to shorter term affective and motivational consequences at work and may warrant investigation. This paper focused only on concurrent relationships between task characteristics and outcomes, but ESM methodology also allows for more sophisticated temporal and cumulative patterns of task characteristics to be investigated. In addition, there is scope to consider other moderators of reactions to short term fluctuations in task characteristics. Some

of these may be traits, while others may be short-lived states such as state goal orientation, fatigue, or task self-efficacy. In sum, there is much to be learned about real-time employee reactions to short term fluctuations in task characteristics. Eventually, this knowledge should be useful in designing jobs and understanding processes at the “micro” job design level.

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